

US EPA RECORDS CENTER REGION 5

June 24, 1981

Reid, Quebe, Allison, Wilcox & Associates, Inc. 120 W. LaSalle Street Suite 606 South Bend, Indiana 46601

Attention: Mr. Dennis M. Neidigh, P.E.

Project Director

Re: Geotechnical Investigation

Final Report

Milepost 10-SR 912 South Interchange

Indiana Toll Road Improvement

Gary, Indiana

ATEC Associates Project 21-03189-10

Corporate Office:

District Offices: Atlanta, GA Baltimale, MU Birmin (tham, AL Cincinno: Dallas, TX Denver, CO Fort Myers, FL Freeport, TX Houston, TX Huntsville, Al Kansas City, KS Lexinaton, KY Louisville, KY Salisbury, MD Savannah, GA Washington, DC York, PA

District Attiliates: Beckley, WV Norklolk, VA

Gentlemen:

Submitted herewith is our final report for the geotechnical engineering study conducted for the 1980 improvements to the East-West Indiana Toll Road. This report pertains specifically to Milepost 10. This study was conducted in accordance with our agreement with the Indiana Toll Road Commission dated October 10, 1980.

This report contains the findings of our field and laboratory studies, and an engineering interpretation of the existing conditions as they pertain to the proposed toll road improvements. Recommendations are provided to aid in the design of foundations or other earth-related components.

We appreciate the opportunity to be of service to you on this project. If we can be of any further assistance, please contact this office.

Very truly yours,

ATEC Associates, Inc.

M. Surendra M. Surendra, Ph.D.

Staff Engineer

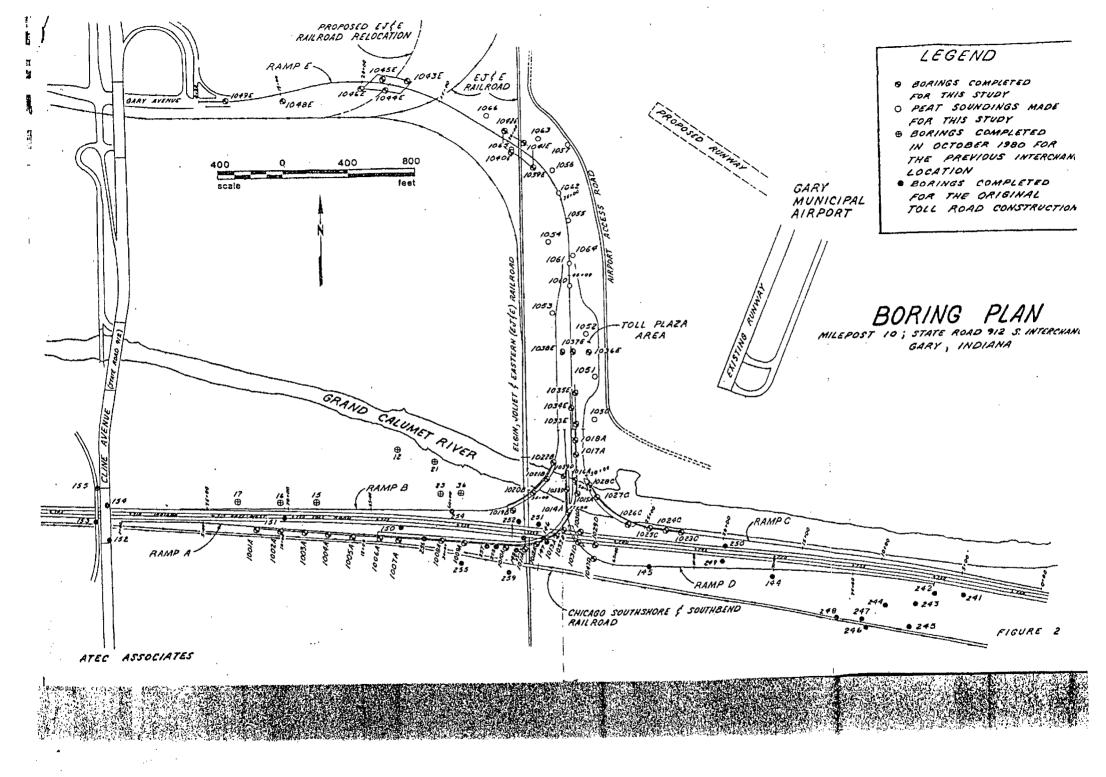
William A. Cutter, P.E. Senior Project Engineer Project Coordinator

bl/TOLL4:V

Copies: (5) RQAW, South Bend

SAME STANDARD

(1) Lawson-Fisher Associates





LOG OF BORING NO. 1010A

Page 1 of 3

CLIENT Indiana Toll Road Comm	JOB NO. 21-03189-10						
PROJECT NAME 1980 Indiana Toll Road	d Impro	vene	nt P	roject			DATE 03-12-81
DEPOSECT LOCATION Mile Post 10: State Ro	oad 912	Sou	th In	nterchai	nge		BORING METHOD CA/RC
BORING LOCATION Station 733+28; 116' I	(C.		STD.	PENETR	ATION	Ö	ROCK CORE DIA. 2.0 IN.
FOREMAND. White				()			SHELBY TUBE DIA IN.
INSPECTOR		H.	ġ	BLOWS/61N; THREE61N, INCREMENTS	aecoveny.%	ELBY TUBE	-
	5 7	<u> </u>	ш,	S/ E6	/EF	37.7	
MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	ЕРТН, І	AMPLE NO,	NE SE	Ö	ELE	BORING AND
SURFACE ELEVATION 591.1	ST DE	1 2	δA	목높	쁀	SH	SAMPLING NOTES
TOPSOIL	0.4						
Brown to Dark Brown slightly moist			1	9 11/13	٦,-		
medium dense fine SAND (SP) with				11/13	75		**Soil classification
trace Silt		L	2	4			by Textural
(SAND)**	5.5	5	-	6/12	50		Classification
Brown wet dense fine SAND (SP) with			3	11			System
trace Silt	<u> </u>	ļ	3	18/28	50		
H		-	<u> </u>				
(SAND)**	İ	-	4	9	50		
H	1	10_	1	18/22	50		
	12.0		1				
Gray moist very dense fine SAND (SP)			1		<u>;</u>		
with trace Silt			 	18	:		
	ľ	15-	5	24/31	75		
(2002)							
(SAND)**							
H	}		1	}			•
H			6	23			
H]	20-	1	36/45	75		
H	22.0		1				
Gray wet very dense SILTY fine SAND		 	1	1			
(SM)			ļ	26			
		25_	7	44/40	100		
		27-]				
(SANDY LOAM)**		ļ	1	{	ļ		
<u>'</u>		<u> </u>	∤	}			
			8	16			
-	j	30_	1	27/34	100		
	31.5	}					
Gray moist medium dense fine SAND (SP)	İ		1		ļ		
with trace Silt	ļ	<u> </u>	<u> </u>	18			
(SAND)**	25.5	35-	9	18/10	100		
	35.5		1		100		
Gray moist stiff SILTY CLAY (CL) with			10	5			
trace fine to coarse Sand and trace Gravel]	6/7	100		
(CLAY)**				!			<u> </u>
(ULAI)**		40	1	1.			i i

WATER LEVEL OBSERVATIONS NOTED ON RODS_____FT.
AT COMPLETION_____FT.

AFTER - Line

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

'THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1010A

Page 2 of 3

CLIENT Indiana Toll Road Com	JOB NO. 21-03189-10						
PROJECT NAME 1980 Indiana Toll Roa	d Impro	vene	nt P	roject			DATE 03-12-81
PROJECT LOCATION Mile Post 10; State Ro BORING LOCATION Station 733+28; 116' H		Sou					BORING METHOD CA/RC
FOREMAN D. White	<u> </u>		STD.	PENETR	ATION	o N	ROCK CORE DIA. 2.0 IN SHELBY TUBE DIA IN
INSPECTOR						~	STILLED! TOBL DIXIIV.
THO EUTON	≱ 1.	1:	2	19 N I	HY,	1	
MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	SAMPLE NO	BLOWS/61N; THREE6IN INCREMENTS	RECOVERY,%	HELBY TUBE	BORING AND SAMPLING NOTES
SURFACE ELEVATION 591.1	νo	 	ŝ	四片区	E E	क	
Gray moist stiff to very stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel		40	11	5 7/9	100		**Soil classification by Textural
(CLAY)**		45-	12	4 5/7	100		Classification System
		50-	13	4 5/7	100		
	59.5	55-	14	4 7/7	100		
Gray moist stiff/to medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel		60-	15	4 4/7	100		Borehole advanced using rotary drilling technique below 60.0'
(CLAY)**		65-	16	3 4/7	100		
		70-	17	4 4/5	100		
Gray slightly moist hard SILTY CLAY (CL) with little fine to coarse Sand ad trace Gravel (CLAY)**	78.5	75-	18	7 7/9	100		

WATER LEVEL OBSERVATIONS
NOTED ON RODS _____FT.
AT COMPLETION _____FT.
AFTER ___HRS.____FT.

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING
RC —ROCK CORING



LOG OF BORING NO. 1010A

Page 3 of 3

C	LIENT Indiana Toll Road Comm	ission				•		JOB NO. 21-03189-10
D	DOJECT NAME 1980 Indiana Toll Road	l Impro	vene	nt P	roject			DATE 03-12-81
D	DO JECT LOCATION Mile Post 10: State Ro	ad 912	Sout	h Ir	terchai	ige		BORING METHOD CA/RC
В	ORING LOCATION Station /33+28; 116' R	tt.					ď	ROCK CORE DIA. $\frac{2.0}{10}$ IN.
	OREMAN D. White				PENETR.			SHELBY TUBE DIAIN.
11	NSPECTOR			õ	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	\ '`~	NB.	
_		. ≥ ±	F.	E E	s/6 6 6 1	Æ.	ELBY TUBE	
	MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	оєртн,	SAMPLE NO	BLOWS/61N; THREE6IN. INCREMENTS	RECOVERY,%	ELE	BORING AND
- 5	SURFACE ELEVATION 591.1	ST	DE	SA	BL TH	RE	SHI	SAMPLING NOTES
	Gray slightly moist hard SILTY CLAY		80	19	8			
	(CL) with little fine to coarse Sand			1.7	16/21	100		**Soil classification
Ц	and trace Gravel					100		by Textural
Ц	(CLAY)**				$\frac{50}{0.1}$			Classification
Н		85.1	85-	20	0.1	0	<u> </u>	System
Н	Gray, slightly weathered, with a					}		Rock Core Run #1:
Н	little solutioning, hard, very close		-			1		85.1' to 95.1'
Н	to closely jointed, fine grained to		·		RC		:	
H	crystalline dolomitic LIMESTONE with oil - tar filled cavities		ļ		Run	83		RQD = 34%
П	off - tal fiffed cavifies		90-		No. 1			11/40 24%
						i		
1								
			ļ					
Н			95-					
Н	Bottom of Test Boring @ 95.1'		<u> </u>					
Н	222-10		}					
Н								
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Н			ļ]
Н	·							
Н			-					
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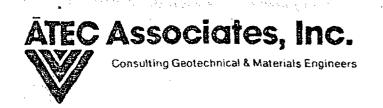
WATER LEVEL OBSERVATIONS NOTED ON RODS ____FT. __FT.

AFTER HER -

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

'THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1022B Page 1 of 3

CLIENT Indiana Toll Road Com PROJECT NAME 1980 Indiana Toll Roa	JÓB NO. 2103189-10 DATE 3/28/81						
PROJECT LOCATION Mile Post 10; State R		Son	th 3	ntercha	inge		BORING METHOD HSA
BORING LOCATION Station 735+75; 460' FOREMAN R. Groves/K. Cardinal	Lt.		STD.	PENETR	ATION	Ö	ROCK CORE DIA IN.
FOREMAN R. Groves/K. Cardinal INSPECTOR						2 ឃ	SHELBY TUBE DIAIN.
Marecion	5 , H	<u> </u>	0	18 IN	,,	108	
MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	SAMPLE NO.	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY,%	SHELBY TUBE	BORING AND SAMPLING NOTES
SURFACE ELEVATION 584.2	νo	۵	જે	# F Z	"	Ś	
Brown dry very loose organic SILTY			1	1			·
SAND (SM) (SANDY LOAM)**	3.0		1	1/1	10		**Soil classification
Gray wet loose fine SAND (SP) with	3.0			4			by Textural
trace Silt	l	5	2	5/5	80	-	Classification
		5		2	1		System
			3	3/3	70		
(SAND)**							
			4	3 5/4	70		
		10		7/4	,,,	•	
				į			
	: 						
		 	5	4			
		15	_	4/8	40		
H				į		ı	
			6	5			
	!	20-	ъ	6/12	100		
 				8			
		25_	7	10/14	100		
		25-		10, 1			
		ļ					
	28.5	ļ					
Wood layer	30.0	 	8	10 10/12	60		
	30.0	30-		10/12	00		
Gray moist very stiff SILTY CLAY (CL) with trace fine to coarse			,				
Sand and Gravel						ļ	
		<u> </u>	9	8			Borehole advanced
		35_		10/10	100		using rotary drilling
H		<u> </u>	}				technique below
H		}					35.0 ft.
				8	100		
		40	10	11/14	100		

WATER LEVEL OBSERVATIONS NOTED ON RODS 3.5 FT. AT COMPLETION ____ FT.

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1022B Page 2 of 3

CLIENT Indiana Toll Road Com 1980 Indiana Toll Road	JOB NO. 2103189-10 DATE 3/28/81						
PROJECT NAME 1980 Indiana 1011 Road PROJECT LOCATION Mile Post 10; State R					nge		BORING METHOD HSA
BORING LOCATION Station 735+75; 460'	Lt.						ROCK CORE DIA IN.
FOREMAN R. Groves/K. Cardinal			STD.	PENETR.	ATION	Ŏ.	SHELBY TUBE DIA IN.
INSPECTOR				- σ	%		01,220. 1002 57
INSPECTOR	-5 t.	17	AMPLE NO	2 Z Z	ECOVERY,%	ELBY TUBE	
	2 .	 	E	S/ E.6 ME	VE	`_	
MATERIAL DESCRIPTION	RA.	ЕРТН,	Q. Œ	SH H	8	ELE	BORING AND
SURFACE ELEVATION 584.2	STRATUM DEPTH, FT.	꿈	SA	BLOWS/61N; THREE.6 IN. INCREMENTS	Ë	SH	SAMPLING NOTES
Gray moist medium stiff SILTY CLAY							
(CL) with trace fine to coarse Sand							**Soil classification
and trace Gravel		<u> </u>		i :			by Textural
and trace graver]			Classification
(CLAY)**			11	4			!
(CLAI)^^		45-	ļ	4/5	100		System
H		<u> </u>	}				
\vdash		 	-	1			
		 	ł				·
\vdash			12] 3			
		50_	1	4/4	100		
		 	į				
	52.0	ļ	-	1	:		•
Gray moist very stiff SILT (ML) with		<u> </u>		i ł			-
a little Clay			13	13			
		55_	1.	14/13	80		
(SILT)**	56.0		ļ				
Gray moist stiff to very stiff							
SILTY CLAY (CL) with a little fine							
to coarse Sand and trace Gravel	} !			5			
		60_	14	6/7	100		ì
(CLAY)**				'	100		
		Ĺ					
		İ	}				
Ц.,,		Ĺ	-	5			·
<u>L'</u>	!	65_	15	5/7	100		
] -, .	100		
				}			
				6			
		70-	16	7/8	100		
		10-		','	100		
				ļ	1		
				_			Tracation
		75-	17	6 9/11			Two attempts were
		15-		9/11	40		made to recover
Gray moist very stiff SILTY CLAY (CL)	77.0						Sample No. 17.
with little fine to coarse Sand and				><	1	,	ĺ
race Gravel with some very thin				(8)	1	į	
Silt seams / (CLAY)**		80	18	10/13	100		
The state of the s				<u> </u>			l

---WATER LEVEL OBSERVATIONS NOTED ON RODS 3.5 FT. AT COMPLETION____FT.

AFTER _ HRS. _ FT.

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING
RC —ROCK CORING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1022B Page 3 of 3

CLIENT								JOB NO. 2103189-10	
PROJECT NA PROJECT LO	ME 1980 Indiana Toll Roa CATION Mile Post 10; State I					nge		DATE 3/28/81 BORING METHOD HSA	
BORING LOC	BORING LOCATION Station 735+75; 460' Lt. STD PENETRATION OF								
FOREMAN INSPECTOR_			Į.	i .	BLOWS/61N; THREE61N.	ECOVERY,%	SHELBY TUBE N	SHELBY TUBE DIA IN	
М .	ATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	SAMPLENO	OWS REE	COVE	ELBY	BORING AND SAMPLING NOTES	
SURFACE ELEV	ATION 584.2	TS G	ä	S,	밀도로	RE	HS.	SAMPLING NOTES	
Gray mois with litt Gray slig (CL) with and trace Gray slig (SM) with Gray slig (ML) with	t very dense SILTY CLAY (CL) le fine Sand and fine Gravel (CLAY)** htly moist hard SILTY CLAY some fine to coarse Sand			20	25 40/ <u>50</u> 0.3 39 50/0.2	100		**Soil classification by Textural Classification System CBorehole caved to 4.0' upon completion.	
. H			-	1				·	

WATER LEVEL OBSERVATIONS NOTED ON RODS 3.5 FT. AT COMPLETION _ ___ FT. C

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC—DRIVEN CASING



LOG OF BORING NO. 1039E

Page 1 of 3

CLIENTJOB NO. 2103189-10											
PROJECT NAME 1980 Indiana Toli Roa							DATE 4/2/81				
PROJECT LOCATION MILE Post 10; State K		Sou	th I	ntercha	nge		BORING METHOD HSA				
BORING LOCATION Station /33+75; 2290'	Lt.	1	CTD	DENCTO	ATION	· ·	ROCK CORE DIA IN.				
FOREMAN R. Hackman			31D.	PENETR		ž	SHELBY TUBE DIA IN.				
INSPECTORM. Surendra			0.	Z St	%	TUBE					
	7. ₹	FT	ž	EN S	<u>}</u>	2					
MATERIAL DESCRIPTION	E E	Ę	PLE	AS EE (Š	Æ.	BORING AND				
	STRATUM DEPTH, FT.	ОЕРТН, FT.	SAMPLENO	BLOWS/61N; THREE 61N. INCREMENTS	чесоуену, %	SHELBY	SAMPLING NOTES				
SURFACE ELEVATION 589.6	0.0	0	ŝ	BLZ	Œ	S					
Brown moist loose to medium dense				1			**Soil classification				
fine SAND (SP) with trace Silt			1	3/3	100		by Textural				
	Ì				100		Classification				
(SAND)**			2	4			System				
	[5-	-	5/6	100		3,500				
-wet below 6.0'				3							
	}		3	3/4	80		Introduced water				
		-		3/4	00		below 7.5 ft to				
<u>L</u>	1		4	3			maintain a stable				
		10-		4/7	100		hole				
	}	<u> </u>	į		!		noie				
	1	<u></u>	1								
	13.0	 									
ray wet dense fine SAND (SP) with	Ì	-	5	9		."					
_race Silt and trace Shells		15-	1	19/23	80						
					ļ	ĺ					
(SAND)**			}]			}				
H	1	-					1				
├-	i		6	9		Ì	į į				
⊢	ļ	20-	1	21/40	100		1				
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- i		-	1		}						
-			{				1				
	1	<u> </u>	7	8		{	1				
-	}	25-	1	26/42	100		1				
-	1	-	1	ļ	!		1				
		-									
	j			12	ļ	Ì	1				
4		-	8	28/38	100	l					
1		30-	1	20/30	100		1				
	}	-	1	1		1	ļ .				
7		-					}				
	1	<u> </u>	<u> </u>	9			<u> </u>				
1	1	-	9	13/18	60	1	1				
7		35-	1	12/10	טס		1				
		-					1				
Gray moist SILTY CLAY (CL) with		 		į							
rrace fine Sand and trace Shells	39.0	-	ļ	3			1				
(CLAY)**	[40	10	3/4	100	{	Two samples taken				
			<u> </u>		L.,,		1				

WATER LEVEL OBSERVATIONS NOTED ON RODS 7.5 FT.

AT COMPLETION ___ FT. AFTER___HRS.___FT. BORING METHOD

HSA-HOLLOW STEM AUGER
CFA-CONTINUOUS FLIGHT AUGER
DC -DRIVEN CASING
MD -MUD DRILLING
RC -ROCK CORING
CA -CASING ADVANCED

THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1039E Page 2 of 3

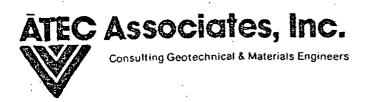
CLIENT Indiana Toll Road Com PROJECT NAME 1980 Indiana Toll Roa PROJECT LOCATION Mile Post 10; State R	JOB NO. 2103189-10 DATE 4/2/81 BORING METHODHSA						
BORING LOCATION Station 733+75; 2290'	Lt.						ROCK CORE DIA IN.
FOREMAN R. Hackman			STD.	PENETR	ATION		SHELBY TUBE DIA IN.
INSPECTOR M. Surendra			ö	Ξ - S	%	TUBE	
	≥ t.	FT	E Z	6 IN 6 IN AEN	ER	=	
MATERIAL DESCRIPTION	AT.	ЕРТН,	SAMPLE NO.	WS REA	õ	ELBY	BORING AND
SURFACE ELEVATION 589.6	STRATUM DEPTH, FT.	30	SAA	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY,%	SHE	SAMPLING NOTES
Gray moist soft to medium stiff	 						
SILTY CLAY (CL) with trace fine			11	3 5/5	100		· •
Sand and trace Shells and trace				2/2	100		[
Gravel			12	3	1		i
4		45-		3/5	100		Borehole advanced
(CLAY)**	Ì	-			1		using rotary drilling
-	İ	·			1		technique below 45.0
	İ			2			
		50_	1:3	4/4	100	-	
					!		
1						ļ	
٠.			14	3	700	1	**Soil classification
4		55_		5/5	100		by Textural Classification
	1						System
4	1				į		System .
7			15	3	-		
	}	60	1)	4/5	100	1	
	1	00			Į.		l l
4		-		-			
4				2		}	i
4			16	3/3	100		
4	66.0	65		1		Ì	
Gray slightly moist soft SILTY CLAY			17	2 3/5	. 100		Sampler was sunk from
(CL) with trace fine Sand and trace			l	3	100	ł	66.0 to 66.5 ft under
Gravel		 	18	4/5	100		its own weight.
-moist below 68.0'	ļ	70		.,_			
4			ĺ	ļ			
(CLAY)**			1				
-some fine to medium Sand from			19	3		-	<u> </u>
74.5 to 75.0'				4/4	100		f
		75] :			·
				1		.]	
1.			1	6		'	į
-			20	5/6	100	1	
	BORING	80	<u> </u>	<u></u>		1	

WATER LEVEL OBSERVATIONS NOTED ON RODS 7.5 FT. AT COMPLETION - FT. AFTER - HOS - ET

BORING METHOD

HSA—HOLLOW STEM AUGER CFA—CONTINUOUS FLIGHT AUGER DC —DRIVEN CASING MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1039E
Page 3 of 3

CLIENT Indiana Toll Road Com	nission	_,					JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road	d Impro	veme	nt P	roject			DATE 4/2/81
PROJECT LOCATION Mile Post 10: State Re	<u>oad 912</u>	Sou	th I	<u>ntercha</u>	nge		BORING METHOD HSA
BORING LOCATION Station 733+75; 2290'	<u>Lt.</u>		STD	PENETR	ΔΤΙΩΝΙ	·	ROCK CORE DIA IN
FOREMAN R. Hackman		t	512.			Z	SHELBY TUBE DIAIN
INSPECTOR M. Surendra			o i	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY,%	TUBE	
	STRATUM DEPTH, FT.	DEPTH, FT	SAMPLE NO	6 11 6 11 AEN	ER	Ĭ	
MATERIAL DESCRIPTION	AT	E	<u> </u>	WS	6	LBY	BORING AND
500 (STR DEP	ם	AN	SE S	2	HEL	SAMPLING NOTES
SURFACE ELEVATION 589.6	0, 0		S	w ⊢ =	Ε.	ທ	
Gray moist meduim stiff SILTY CLAY		<u> </u>					
(CL) with trace to some fine Sand		<u> </u>					**Soil classification
and trace Gravel		 		,			by Textural
			21	4	700		Classification
(CLAY)**		85-	İ	4/8	100		System
		<u> </u>					
\square		·					
H				_			
			22	5	700		İ
H	90.5	90-	-	7/10	100		1
Gray slightly moist hard SILTY CLAY		 	1	ļ			
(CL) with trace Sand and trace Gravel			Ì				
*1	ļ			10			
(CLAY)**	•	<u> </u>	23	18	7.00		
H]	95-	<u> </u>	26/32	100		\$ 999 h
 	Ì	<u> </u>	1	<u> </u>			
H .							
		<u> </u>					
		<u> </u>	24	20			
H		100-		35/38	100		
} -		ļ					
		<u> </u>		7.5			
			25	15			
H		105		20/33	60		
 							
} -	1		(
		 		0.0			
} -		 	26	22	100		
		110-		20/30	100		
Bottom of Test Boring @ 110.0'							
		<u> </u>					
		-					
		ļ			1		
H		-					
}							
J L		 			l		
		 -					
[-]	-	 		·			
		1		l			

WATER LEVEL OBSERVATIONS NOTED ON RODS 7.5 FT. AT COMPLETION _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGER CFA-CONTINUOUS FLIGHT AUGER DC -DRIVEN CASING



LOG OF BORING NO. 1040E

	•						
CLIENT Indiana Toll Road Co	ommission				•		JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Ro							DATE 4/10/81
PROJECT LOCATION Mile Post 10; State	BORING METHOD HSA						
BORING LOCATION Station 732+50; 2380	ROCK CORE DIA IN						
FOREMAN R. Hackman	- 	1	515.	PENETR	·	4	SHELBY TUBE DIAIN
INSPECTOR A. Spencer	-		ġ	N N N N N N N N N N N N N N N N N N N	%' ≻	8	
	Si	БЕРТН, РТ	SAMPLENO	S/6	RECOVERY,%	SHELBY TUBE	
MATERIAL DESCRIPTION	TAT PTF	i d	<u>M</u>	D HEE	ģ	1.8	BORING AND
SURFACE ELEVATION 584.6	STRATUM DEPTH, FT.	E E	SA	BLOWS/61N; THREE 61N INCREMENTS	ÄË	SH	SAMPLING NOTES
Dark Brown moist loose SILTY organic				2			
SAND (SM) with roots	1.5		1	3/4	80		Two samples taken
(SANDY LOAM)**	/i						The samples taken
Brownish Gray wet loose fine to	_		2	2			
medium SAND (SP) with trace Silt	1	5-		2/4	100		Maria - 1
H	į		3	3]		**Soil classification by Textural
(SAND)**	8.0		,	3/5	100		Classification
Gray wet dense to very dense SAND			,	12			System
(SM) with little Silt		10-	4	16/25	100		
		10-	!		-00		
-very thin wood seam at 9.5'							
(SANDY LOAM)**				15			
H (DANDI LOAN)	1		5	38/50			
H		15		0.4	100		
			-	·			
} 					}		
				17			
		20-	6	28/33	100		
		20	į				
					j		
H		<u> </u>	7	15		į	
H		25		23/28	100		
 -	27.0						
Gray wet medium dense very fine SAND							
(SM) with little Silt	'			8			
Comy with little silt		30-	8	12/17	75	j	•
(SANDY LOAM)**		30-					
	32.5		į		j		
Company of the	32.3	[]				Ì	
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand			9	3			
and trace small Gravel		35	١	3/4	90		
(CLAY)**	Λ	}	į			ļ	
	<u>-</u> /	\vdash					
Bottom of Test Boring @ 35.0'						- 1	
		المسمسا		ليستستند	ليسيب		

WATER LEVEL OBSERVATIONS NOTED ON RODS $1.0\,$ FT. AT COMPLETION $-\,$ FT.

BORING METHOD

HSA—HOLLOW STEM AUGER CFA—CONTINUOUS FLIGHT AUGER DC—DRIVEN CASING MD—MUD DRILLING



LOG OF BORING NO. 1046E

Page 1 of 3

CLIENT Indiana Toll Road Comm	JOB NO. 2103189-10.						
PROJECT NAME 1980 Indiana Toll Road	DATE 4/7/81						
PROJECT LOCATION Mile Post 10; State Ro	BORING METHOD HSA						
BORING LOCATION Station 723+00; 2751'	ROCK CORE DIA IN.						
FOREMAN R. Hackman			0.0.	PENETR		ž	SHELBY TUBE DIAIN.
INSPECTOR A. Spencer	_ +i	<u>, .</u>	ò	N N N N N N N N N N N N N N N N N N N		TUBE	·
	5 7	L .	in i	S/6	/E.P	7	
MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	рертн, FT.	SAMPLE NO.	BLOWS/61N; THREE61N. INCREMENTS	RECOVERY,%	SHELBY	BORING AND
SURFACE ELEVATION 586.7	ST	DE	SA	무도공	RE	SH	SAMPLING NOTES
Gray dry very stiff ash with some				,			
slag cobbles (FILL)	2.0		1	4 50/0.2	20		**Soil classification
Tan dry medium dense fine SAND (SP)				20/0.2	80		by Textural
with trace Silt			2	4			Classification
H		5 –		5/7	100		System
(SAND)**			3	4		İ	
		-		9/13	100		
			4	5			
		10 -	1 .	7/8	100	ļ	
				}			
	12.0	 					
Gray wet dense to medium dense fine		<u> </u>					
SAND (SP) with trace Silt		-	5	8		1	
(SAND)**		15-		17/21	100		
(SAND)		-		1			
T.			1			}	
			.6	3			
		20-		5/12	100		
			1				
H		-	{				
	24.2	-		1/			
562.5	24.2	25_	7	14 29/37	100		True general on taken
Gray wet very dense fine to coarse SAND (SP) with trace Silt and trace	24.8	, 25-	1	27/3/	100		Two samples taken.
Gravel (SAND)**]				!
	į						
Gray wet medium dense fine SAND (SP) with trace Silt		-	8	8			_
(SAND)**		30 -	{	11/18	100		
		-	-				
thin fine to coarse Sand seam at 29.0 to 29.2	33.0	-	ł				
Gray and Brown wet loose fine to				8		İ	
coarse SAND (SP) with little Gravel		35-	9	3/3	35		
(SAND)**	36.0	- (,		1		İ	
Gray moist medium stiff SILTY CLAY						1	1
(CL) with trace fine to coarse Sand		-	}	3			1
and trace Gravel (CLAY)**			10	3/4	100		ļ
	L	<u> </u>	L	3/4	100		<u> </u>

WATER LEVEL OBSERVATIONS NOTED ON RODS 11.0 FT. AT COMPLETION FT.

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

'THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS RORING



LOG OF BORING NO. 1046E Page 2 of 3

CLIENT Indiana Toll Road Com PROJECT NAME 1980 Indiana Toll Roa	d Impro	veme	ent P	roject			JOB NO. 2103189-10 DATE 4/7/81		
PROJECT LOCATION Mile Post 10; State R	oad 912	Sou	th I	ntercha	nge		BORING METHOD HSA ROCK CORE DIA IN.		
BORING LOCATION Station 723+00; 2751	STD DEMETDATION OF								
FUNEIVIAIN			-			Z	SHELBY TUBE DIA IN.		
INSPECTOR A. Spencer	 -	Į.	9	N Z Z	١٧,%	S			
MATERIAL DESCRIPTION	STRATUM DEPTH, FT	ЕРТН, F	AMPLE NO	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY, %	SHELBY TUBE	BORING AND SAMPLING NOTES		
SURFACE ELEVATION 586.7	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ä	જે	∞ † ≥	뿚	Ω.	DAMI ENGLISTES		
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand			11	3 4/5	100		**Soil classification by Textural		
(CLAY)**	44.8	45-	12	4 4/5	100		Classification System		
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**	48.0				-				
Gray moist medium stiff SILTY CLAY (CL) with trace fine Sand		50-	13	3 5/5	80				
(CLAY)**	52.5						·		
Gray moist stiff to medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace small Gravel		55-	14	4 5/7	100				
(CLAY)**		60-	15	4 4/5	100		·		
-two thin Silty Sand seams from 64.0 to 64.4'		65-	16	4 6/6	100				
		70-	17	- 4 4/5	100				
		75-	18	4 4/5	100				
		80	19	5 5/7			-		

WATER LEVEL OBSERVATIONS NOTED ON RODS 11.0FT. AT COMPLETION _____FT.

BORING METHOD

HSA-HOLLOW STEM AUGER CFA-CONTINUOUS FLIGHT AUGER DC -DRIVEN CASING MD -MUD DRILLING *THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING



LOG OF BORING NO. 1046E

Page 3 of 3

CLIENT Indiana Toll Road Comm PROJECT NAME 1980 Indiana Toll Road	JOB NO. <u>2103189-10</u> DATE <u>4/7/81</u>						
PROJECT LOCATION Mile Post 10; State Ro	BORING METHOD HSA						
BORING LOCATION Station 723+00; 2751'	ö	ROCK CORE DIA IN.					
FOREMAN R. Hackman				PENETRA	.0	Z	SHELBY TUBE DIAIN.
INSPECTOR A. Spencer	- H	FT.	N O	N N N	٠, ١	TUBE	
MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	ОЕРТН, Р	SAMPLENO	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY,%	SHELBY.	BORING AND SAMPLING NOTES
SURFACE ELEVATION 586.7			S,	0 F Z	, K	σ̈	
Gray moist stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)** Gray moist stiff to very stiff SILTY CLAY (CL) with little fine to coarse Sand and trace Gravel (thin fine to coarse Sand seams from 83.5 to 84.0	80.5 84.0 87.0	85-	20	9 9/12	100		Two samples taken.
ft) (CLAY)** Gray moist very stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**	92.0	90-	21	17 23/24	80		**Soil classification by Textural Classification
Gray slightly moist hard CLAYEY SILT (CL-ML) with some fine to coarse Sand and trace Gravel (SILTY CLAY)**	-	95-	22	18 22/27	100		System
Gray slightly moist hard SILTY CLAY (CL) with some fine to coarse Sand and trace Gravel (CLAY)**							
Bottom of Test Boring @ 95.0'		_					
				·			

WATER LEVEL OBSERVATIONS NOTED ON RODS 11.0 FT. AT COMPLETION _____FT.

BORING METHOD

HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING



1049E LOG OF BORING NO.

	•	•						·
C	IENT Indiana Toll Road Comm	JOB NO. 2103189-10						
P	ROJECT NAME 1980 Indiana Toll Road							DATE 4/8/81
P	ROJECT LOCATION Mile Post 10; State Ro	ad 912	Sout	h Ir	terchar	ige		BORING METHOD HSA
B	ORING LOCATION Station 714+80; 2640'	Lt.		CTO	DENETO	ATION		ROCK CORE DIA IN
F	DREMAN R. Hackman		,	51D.	PENETR	AHON	2	SHELBY TUBE DIA IN
IN	SPECTOR A. Spencer		1		7 . ST	%	BE	
		ΣΈ	1	Ž	6 IN	H.	1	
1	MATERIAL DESCRIPTION	TH,	E	2	WS EE	∑.	.ΒY	BORING AND
<u> </u>		STRATUM DEPTH, FT.	БЕРТН, FT.	SAMPLE NO.	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY,%	несву тиве	SAMPLING NOTES
S	URFACE ELEVATION 586.1	S	<u> </u>	S	8 + ≤	æ	S	
Н	TOPSOIL 0.1				2			
Н	Tan dry loose to medium dense fine			1	2/2	100		**Soil classification
\mathbb{H}	SAND (SP) with trace Silt					100		by Textural
Н	(0.125			2	3			Classification
H	(SAND)**		5-		4/4	100		System
Н	•				4			
H	i			3	7/8	100		
H						_		
Н		9.5		4	4		-	
H	Construction of the contract o		10-		9/11	100		Two samples taken.
Н	Gray moist to wet very dense very fine SAND (SP) with trace Silt							
H	Time SAND (Sr) with trace Sitt							
•	(SAND)**				12			
1:	(SHM) ~ ~			5	20/32	100		
Н			15		20/32	100		
H								
H								
H					1.5			
H	•			6	35/45	100		C
1+			20-			100		Borehole caved to
H	Bottom of Test Boring @ 20.0'						l	10 ft upon
H				ļ				completion.
H								
Н								'
П								
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1			1	l		1		

WATER LEVEL OBSERVATIONS NOTED ON RODS 11.2FT. AT COMPLETION____FT. C AFTER. - HRS FT

BORING METHOD

HSA—HOLLOW STEM AUGER CFA—CONTINUOUS FLIGHT AUGER DC—DRIVEN CASING MD—MUD DRILLING